Amendments to the Claims:

Please amend the claims as follows:

1.   (Original) A battery state-of-charge estimator comprising:

a voltage detector unit which detects a voltage of a battery;

an internal resistance estimator unit which estimates an internal resistance of the battery;

an estimated charging/discharging current calculator unit which calculates an estimated charging/discharging current of the battery based on the internal resistance of the battery determined by the internal resistance estimator unit, the voltage of the battery, and an open voltage of the battery;

an SOC estimator unit which estimates a state of charge SOC of the battery based on the estimated charging/discharging current determined by the estimated charging/discharging current calculator unit; and

an open voltage calculator unit which sets the measured voltage of the battery as the open voltage of the battery at an initial calculation of the charging/discharging current and, after the initial calculation, calculates the open voltage of the battery based on the SOC which is previously estimated.

2.   (Original) A battery state-of-charge estimator comprising:

a voltage detector unit which detects a voltage of a battery;

an internal resistance estimator unit which estimates an internal resistance of the battery from a state of the battery;

an estimated charging/discharging current calculator unit which calculates an estimated charging/discharging current of the battery based on the internal resistance of the battery determined by the internal resistance estimator unit, the voltage of the battery, and an open voltage of the battery;

a first SOC estimator unit which estimates a state of charge of the battery based on the estimated charging/discharging current determined by

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the estimated charging/discharging current calculator unit; and

an open voltage calculator unit which sets the measured voltage of the battery as the open voltage of the battery at an initial calculation of the charging/discharging current and, after the initial calculation, calculates the open voltage of the battery based on the SOC which is previously estimated.

3.   (Original) A battery state-of-charge estimator according to Claim 2, further comprising:

a temperature detector unit which detects a temperature of the battery; wherein

the internal resistance estimator unit estimates the internal resistance based on the temperature of the battery.

4.   (Currently amended) A battery state-of-charge estimator according to either Claim 2 or 3 Claim 2, further comprising:

a current detector unit which detects a charging/discharging current of the battery;

an internal resistance calculator unit which calculates the internal resistance of the battery based on the measured charging/discharging current of the battery which is detected by the current detector unit and the voltage of the battery which is detected by the voltage detector unit; and

an internal resistance corrector unit which intermittently corrects the estimated internal resistance which is estimated by the internal resistance estimator unit based on the internal resistance determined by the internal resistance calculator unit.

5.   (Currently amended) A battery state-of-charge estimator according to either Claim 3 or 4 Claim 3, wherein

the internal resistance corrector unit corrects a relationship between

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the estimated internal resistance and the temperature of the battery based on the internal resistance which is determined by the internal resistance calculator unit and the measured battery temperature.

6.   (Original) A battery state-of-charge estimator comprising:

a current detector unit which detects a charging/discharging current of a battery;

a voltage detector unit which detects a voltage of the battery;

an internal resistance calculator unit which calculates an internal resistance of the battery based on the measured charging/discharging current of the battery which is detected by the current detector unit and the voltage of the battery which is detected by the voltage detector unit;

an estimated charging/discharging current calculator unit which calculates an estimated charging/discharging current of the battery based on the internal resistance of the battery which is determined by the internal resistance calculator unit, the voltage of the battery, and an open voltage of the battery;

a second SOC estimator unit which estimates a state of charge of the battery based on the estimated charging/discharging current which is determined by the estimated charging/discharging current calculator unit; and

an open voltage calculator unit which sets the measured voltage of the battery as the open voltage of the battery at an initial calculation of the charging/discharging current and, after the initial calculation, calculates the open voltage of the battery based on the SOC which is previously estimated.

7.   (Original) A battery state-of-charge estimator comprising:

a current detector unit which detects a charging/discharging current of a battery;

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a voltage detector unit which detects a voltage of the battery;

an internal resistance estimator unit which estimates an internal resistance of the battery from a state of the battery;

a first estimated charging/discharging current calculator unit which calculates an estimated charging/discharging current of the battery based on the internal resistance of the battery which is determined by the internal resistance estimator unit, the voltage of the battery, and an open voltage of the battery;

a first SOC estimator unit which estimates a state of charge of the battery based on the estimated charging/discharging current which is determined by the first estimated charging/discharging current calculator unit;

an internal resistance calculator unit which calculates an internal resistance of the battery based on the measured charging/discharging current of the battery which is detected by the current detector unit and the voltage of the battery which is detected by the voltage detector unit;

a second estimated charging/discharging current calculator unit which calculates an estimated charging/discharging current of the battery based on the internal resistance of the battery which is determined by the internal resistance calculator unit, the voltage of the battery, and the open voltage of the battery;

a second SOC estimator unit which estimates a state of charge of the battery based on the estimated charging/discharging current which is determined by the second estimated charging/discharging current calculator unit;

a switching unit which switches between the SOC from the first SOC estimator unit and the SOC from the second SOC estimator unit based on the state of the battery; and

an open voltage calculator unit which sets the measured voltage of

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the battery as the open voltage of the battery at an initial calculation of the charging/discharging current and, after the initial calculation, calculates the open voltage of the battery based on the SOC which is previously estimated.

8.   (Original) A battery state-of-charge estimator according to Claim 7, further comprising:

an abnormality detector unit which compares the measured charging/discharging current value detected by the current detector unit and the estimated charging/discharging current value calculated by the estimated charging/discharging current calculator unit, and determines that the current detector unit is abnormal when a difference between the charging/discharging current values is greater than a predetermined difference and that the current detector unit is normal when the difference is a predetermined difference or smaller, wherein

the switching unit switches to the SOC from the first SOC estimator unit when the abnormality detector unit determines that the current detector unit is abnormal and switches to the SOC from the second SOC estimator unit when the abnormality detector unit determines that the current detector unit is normal.

9.   (Currently amended) A battery state-of-charge estimator according to ~~either Claim 3 or 5~~ Claim 3, wherein

the temperature detector unit is placed in the battery, on a surface of the battery, or near the surface of the battery.

10.   (Currently amended) A battery state-of-charge estimator according to ~~any one of Claims 1 through 9~~ Claim 1, wherein

at least one of the first SOC estimator unit, the second SOC estimator unit, and the SOC estimator unit periodically estimates the SOC at a

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predetermined interval.

11.   (Currently amended) A battery state-of-charge estimator according to ~~any one of Claims 1 through 3~~ Claim 1, further comprising:

a current detector unit which detects a charging/discharging current of the battery;

a first battery full-capacity calculator unit which determines a full capacity of the battery based on the SOC which is estimated by the SOC estimator unit or the first SOC estimator unit and an integrated value of the charging/discharging current of the battery which is detected by the current detector unit during the estimation of the SOC; and

a third SOC estimator unit which estimates a state of charge of the battery based on the full capacity of the battery which is obtained by the first battery full-capacity calculator unit and the measured charging/discharging current of the battery which is detected by the current detector unit.

12.   (Currently amended) A battery state-of-charge estimator according to ~~any one of Claims 4 through 8~~ Claim 4, further comprising:

a second battery full-capacity calculator unit which determines a full capacity of the battery based on the SOC which is estimated by the first SOC estimator unit or the second SOC estimator unit and an integrated value of the charging/discharging current of the battery which is detected by the current detector unit during the estimation of the SOC, and

a fourth SOC estimator unit which estimates a state of charge of the battery based on the full capacity of the battery which is obtained by the second battery full-capacity calculator unit and the measured charging/discharging current of the battery which is detected by the current detector unit.

13.　(Currently amended)　A battery state-of-charge estimator according to ~~either Claim 11 or 12~~ Claim 11, further comprising:

a remaining capacity detector unit which detects a remaining capacity of each individual cell within the battery; and

a remaining energy calculator unit which detects a minimum remaining capacity based on the remaining capacity of each individual cell which is obtained from the remaining capacity detector unit and calculates an amount of remaining energy of the battery based on the minimum remaining capacity.

14.　(Currently amended)　A battery state-of-charge estimator according to ~~any one of Claims 1 through 13~~ Claim 1, wherein

the estimated charging/discharging current calculator unit, the first charging/discharging current calculator unit, or the second charging/discharging current calculator unit calculates the estimated charging/discharging current of the battery based on the internal resistance of the battery, the voltage of the battery, the open voltage of the battery, and a polarization voltage.

15.　(Original)　A battery state-of-charge estimator according to Claim 14, further comprising:

a current detection abnormality detector unit which compares the measured charging/discharging current value which is detected by the current detector which detects the charging/discharging current of the battery and the estimated charging/discharging current value which is determined by one of the estimated charging/discharging current calculator unit, the first charging/discharging current calculator unit, and the second charging/discharging current calculator unit, and determines that the current detector unit is abnormal when a difference between the current values is

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greater than a predetermined difference and that the current detector unit is normal when the difference is a predetermined value or smaller, wherein

the SOC is estimated based on the estimated charging/discharging current value when the current detection abnormality detector unit determines that the current detector unit is abnormal and the SOC is estimated using the measured charging/discharging current value when the current detection abnormality detector unit determines that the current detector unit is normal.

16. (Original) A battery state-of-charge estimator according to Claim 14, wherein

in consideration of on an environmental temperature of the battery, one of the measured charging/discharging current value which is detected by the current detector unit which detects the charging/discharging current of the battery and the estimated charging/discharging current value which is determined by one of the estimated charging/discharging current calculator unit, the first charging/discharging current calculator unit, and the second charging/discharging current unit is selected and

the SOC is estimated based on the selected charging/discharging current value.

17. (Original) A battery state-of-charge estimator according to Claim 14, further comprising:

a charging/discharging prohibiting unit which prohibits charging and discharging of the battery when the charging/discharging current of the battery considering the polarization voltage exceeds a predetermined value.

18. (Currently amended) A battery state-of-charge estimator according to any one of Claims 11 through 17 Claim 11, wherein

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the temperature detector unit is placed in the battery, on a surface of the battery, or near the surface of the battery.

19.   (Currently amended) A battery state-of-charge estimator according to ~~any one of Claims 11 through 18~~ Claim 11, wherein

at least one of the first SOC estimator unit, the second SOC estimator unit, and the SOC estimator unit periodically estimates the SOC at a predetermined interval.